REMARKS

Applicant requests favorable reconsideration and allowance of this application in view of the foregoing amendments and the following remarks.

Claims 1-11, 13, 16, 18, and 29 are pending in this application, with Claims 1, 18, and 29 being independent.

Claims 1, 18 and 29 have been amended. Applicant submits that support for the new claims and the amendments can be found in the original disclosure, and therefore no new matter has been added.

Claims 1-11, 13, 16, 18 and 29 are rejected under 35.U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,846,134 (Latypov) in view of U.S. Patent No. 5,913,727 (Ahdoot). Applicant respectfully traverses this rejection for the reasons discussed below.

The present invention recited in Claim 1 is directed to a user interface apparatus that determines a user instruction using data from sensors attached to body portions of the user. A problem arises in trying to make such a determination from a single sensor or from sensors that output only information about the position of the sensor. In particular, a single sensor only outputs information about the portion on which the sensor is attached. If the sensor moves between two different positions, the output of the sensor is substantially the same regardless of the motion or action of the body portion to which it is attached. For example, a sensor attached to the hand of a user may output the same values in each of the following cases: (i) the user moves the hand down, and (ii) the user sits down without moving the hand relative to the body. In other words, the true action cannot be determined based on a single sensor attached to the hand.

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Even if increased numbers of sensors are used, if the outputs of the sensors are used separately, only the position changes output by each sensor are detected. For example, if sensors are attached to the hand and the head of a user, only the position information about the hand and the head is output, and it may not be possible to determine the true actions that occur when the position data is changing.

To address this problem, the present invention recited in Claim 1 includes, *inter alia*, the feature wherein action information is generated on the basis of a transition of an estimated relative position between first and second body portions. By generating action information based on the transition of an estimated relative position, the true action that produced changes in sensor positions can be determined more accurately. Applicant submits that the cited art fails to disclose or suggest at least this feature of Claim 1. A similar feature is also recited in Claims 18 and 29.

Latypov discloses detection of positions of the foot and hand of a user 3 using sensors 10, 13 and a receiver 11. As shown in Fig. 3, the user 3 can move within a spherical-shape, rotatable shell 4. In column 5, lines 28-30, the patent states 'The apparatus also comprises means 9 for determining the magnitude and direction of the movement of the user 3 relative to the shell . . . .'' The means 9 consists of the combination of the sensor 10 and the receiver 11. Col. 5, lines 31-34. Thus, Latypov only discloses detection of movement relative to the shell. Nowhere does that patent disclose or suggest detecting a relative location of one sensor relative to the other.

Ahdoot discloses sensors 30 for receiving light emitted from a display means 20 and detection of a sensor position based on the light emitting position of the display and the sensor that detects the light. Col. 5, lines 62-67. Thus, that patent

discloses detecting positions by sensors 30 that are fixed and limited within the display means 20. <u>Ahdoot</u> does not disclose or suggest detecting a relative location of one sensor with respect to another.
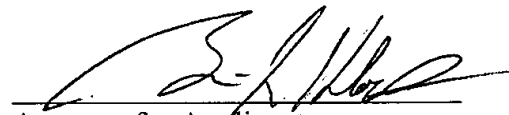
Moreover, neither of the cited patents, nor their combination, discloses or suggests at least the feature of generating action information on the basis of a transition of the estimated relative position between two body portions, as recited in Claims 1, 18, and 29. Accordingly, Applicant submits that the present invention recited in those claims is patentable over the cited art.

The dependent claims recite additional features that further distinguish them from the cited art. Individual consideration of the dependent claims is requested.

For the foregoing reasons, Applicant submits that this application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-mentioned Office Action, entry of this Amendment After Final Rejection, and an early Notice of Allowance are requested.

Applicant's undersigned attorney may be reached in our Washington, DC office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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MARKED-UP VERSION SHOWING AMENDMENTS TO CLAIMS

1. (Four Times Amended) A user interface apparatus comprising:

a first sensor attached to a first portion of a body of a user;

a second sensor attached to a second portion of the user, which is different from the first portion;

an estimating unit arranged to estimate a relative position of the second portion with respect to the first portion in accordance with results of detection by said first and second sensors;

a generation unit arranged to generate action information on the basis of a transition of the estimated relative position;

a determination unit arranged to determine a user instruction corresponding to the generated action information; and

an image generating unit arranged to generate an image on the basis of said user instruction.

18. (Four Times Amended) A user interface method for outputting a user instruction to a predetermined apparatus or program, comprising:

the step of detecting a location of a first portion of a body of a user and a location of a second portion of the user, which is different from the first portion, by using first and second sensors attached to the user;

the step of estimating a relative position of the second portion with respect

to the first portion in accordance with results of detection by the first and second sensors in

said detecting step;

the step of generating action information on the basis of a transition of the

estimated relative position; and

the step of determining a user instruction corresponding to the generated

action information and outputting the determined user instruction to the apparatus or

program.

29. (Four Times Amended) A computer readable storage medium, which

stores a program of a user interface method for outputting a user instruction to a

predetermined apparatus or program, storing:

a program step of detecting a location of a first portion of a body of a user

and a location of a second portion of the user, which is different from the first portion, by

using first and second sensors attached to the user;

a program step of estimating a relative position of the second portion with

respect to the first portion in accordance with results of detection by the first and second

sensors in said program step of detecting;

a program step of generating action information on the basis of a transition

of the estimated relative position; and

a program step of determining a user instruction corresponding to the

generated action information and outputting the determined user instruction to the

apparatus or program.